AF/1773 & IFW

# TRANSMITTAL OF APPEAL BRIEF

Docket No.
OKA-0019

In re Application of: Tadayoshi Iijima

| Application No. | Filing Date | Examiner | Group Art Unit |
|---|---|---|---|
| 09/748,188-Conf. #2973 | December 27, 2000 | N. J. Uhlir | 1773 |

Invention: TRANSPARENT CONDUCTIVE FILM AND METHOD FOR PRODUCING THE SAME

**TO THE COMMISSIONER OF PATENTS:**

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed: June 21, 2004 .

The fee for filing this Appeal Brief is 330.00 .

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Dated: August 23, 2004

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Docket No.: OKA-0019
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:
Tadayoshi Iijima

Application No.: 09/748,188 Confirmation No.: 2973

Filed: December 27, 2000 Art Unit: 1773

For: TRANSPARENT CONDUCTIVE FILM AND METHOD FOR PRODUCING THE SAME Examiner: N. J. Uhlir

## APPELLANT'S BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on June 21, 2004.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate.

This brief contains items under the following headings as required by 37 C.F.R. § 1.192 and M.P.E.P. § 1206:

I. Real Party In Interest
II Related Appeals and Interferences
III. Status of Claims
IV. Status of Amendments
V. Summary of Invention
VI. Issues
VII. Grouping of Claims

## I. REAL PARTY IN INTEREST

The real party in interest for this appeal is TDK Corporation of Tokyo, Japan ("TDK"). An assignment of all rights in the present application to TDK was executed by the inventor and recorded by the U.S. Patent and Trademark Office at **reel 011395, frame 0593.**

## II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

## III. STATUS OF CLAIMS

### A. Total Number of Claims in Application

There are 7 claims pending in application.

### B. Current Status of Claims

1. Claims canceled: 1
2. Claims withdrawn from consideration but not canceled: 4, 5, 6, and 7
3. Claims pending: 2, 3, and 8
4. Claims allowed: None
5. Claims rejected: 2, 3, and 8

### C. Claims On Appeal

The claims on appeal are claims 2, 3, and 8

## IV. STATUS OF AMENDMENTS

Applicant filed an Amendment After Final Rejection on December 8, 2003. The Examiner responded to the Amendment After Final Rejection in an Advisory Action mailed January 14, 2004. In the Advisory Action, the Examiner indicated that Applicants' proposed amendments to claim 8 would not be entered. Applicant filed a Request for Continued Examination with a Preliminary Amendment on February 6, 2004. A non-final Office Action dated March 3, 2004 rejected claims 2, 3 and 8, all claim amendments having been entered. Having been three times rejected, Applicant filed a Notice of Appeal on June 21, 2004.

Accordingly, the claims enclosed herein as Appendix A incorporates all amendments to claims 2, 3, and 8, as indicated in the paper filed by Applicant on February 6, 2006.

## V. SUMMARY OF INVENTION

Claim 8 recites a transparent conductive film comprising: a compressed layer 12 on a support 14, said compressed layer having conductive fine particles and a resin, said resin being approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of said conductive fine particles, said compressed layer formed by compressing the conductive fine particles and the resin on the support, wherein said compressed layer further comprises an impregnated transparent substance. The fine particles of the compressed layer is disclosed variously throughout the specification, for example, at page 12, line 19 to page 13, line 1; page 13, line 12 to page 14, line 1. The resin of the compressed layer is disclosed variously throughout the specification, for example, at page 14, line 2 to page 16, line 8. The support is disclosed variously throughout the specification, for example, at page 19, lines 7-20. The impregnated transparent substance is disclosed variously throughout the specification, for example, where "the obtained conductive film has a low dielectric resistance and little scattering of light, since the voids in the compressed layer is impregnated with a transparent substance ..." at page 27, line 2 to page 28, line 10. Support is disclosed for the amount of resin being approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of the conductive fine particles, for example, in Table 1.

## VI. ISSUES

1. Whether the Examiner erred in rejecting claims 2-3 and 8 under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent 5,411,792 to Yukinobu et al. (Yukinobu et al. '792)?

## VII. GROUPING OF CLAIMS

For purposes of this appeal brief only, and without conceding the teachings of any prior art reference, the claims have been grouped as indicated below:

Group Claim(s)
I. Claims 2, 3, and 8 stand or fall separately with respect to the §103 rejection

In Section VIII below, Applicant has included arguments supporting the separate patentability of each claim group as required by M.P.E.P. § 1206.

## VIII. ARGUMENTS

In the Office Action of March 3, 2004, the following rejections were presented by the Examiner:

(i) 35 U.S.C. §112, first paragraph

None

(ii) 35 U.S.C. §112, second paragraph

None

(iii) 35 U.S.C. §102

None

(iv) 35 U.S.C. §103

(1) The Examiner rejected claims 2, 3, and 8 under 35 U.S.C. §103(a) as being unpatentable over Yukinobu et al. '792.

(v) Other

None

For at least the following reasons, Appellant submits that this rejection is both technically and legally unsound and should therefore be reversed.

**(i) 35 U.S.C. §112, first paragraph**

None

**(ii) 35 U.S.C. §112, second paragraph**

None

**(iii) 35 U.S.C. §102**

None

**(iv) 35 U.S.C. §103**

(1) The Office Action rejected claims 2, 3, and 8 under 35 U.S.C. §103(a) as being unpatentable by Yukinobu et al. '792 in paragraph 3 of the Office Action mailed March 3, 2004. Appellant respectfully traverses this rejection.

Appellant notes that the examiner continues to parse the claims, stating that the limitation "formed by compressing the conductive fine particles and the resin on the support" is a process limitation, and does not further limit the structure of the product. Appellant disagrees. Still further, the examiner alleges that all of the limitations of claim 2 are product by process limitations and do not further limit the independent claim. Appellant disagrees.

Claim 8 recites a transparent conductive film comprising: a compressed layer on a support, said compressed layer having conductive fine particles and a resin, said resin being approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of said conductive fine particles, said compressed layer formed by compressing the conductive fine particles and the resin on the support, wherein said compressed layer further comprises an impregnated transparent substance.

Regarding Yukinobu et al. '792, the examiner alleges that all the claim elements are taught. See the Office Action at paragraph 10. The Office Action acknowledges at paragraph 7 that the reference does not teach 0.03-9.3 parts by volume of the resin binder with respect to 100 parts by volume of the conductive particles. The examiner opines in paragraph 8 of the Office Action that this is allegedly a results effective variable, and that the reference teaches that if the amount of resin binder present in the film is "too much," the film will not exhibit good resistivity, "whereas if too little resin is utilized, the film is excessively porous and becomes hazy." The examiner concludes that "it would have been obvious ... to control the amount of binder resin in the film of Yukinobu in order to obtain a transparent conductive film that exhibited the desired resistance and haze properties." However, the examiner refers only to the background portion of Yukinobu et al. '792. Yukinobu et al. '792 do not disclose, teach or suggest the ranges claimed, and as this is a discussion of the shortcomings of the prior art, this can be considered no more than an invitation to experiment. The examiner then states that it "is the examiner's position that after the heat treatment step" of Yukinobu et al. '792 in examples 15-18, "a small residual amount of resin binder will remain." This is a conclusion reached by the examiner without support from the applied reference, and as such is clearly a situation of the examiner taking official notice.

This Official Notice was timely challenged by the Appellant in the Amendment filed July 14, 2003 and again December 8, 2003. The examiner responded to the first challenge by referring to a Belgium reference not of record. The examiner has failed to respond to the second challenge. Accordingly, the examiner having twice failed to properly respond to the challenge

of Official Notice, the conclusion reached by the examiner is de facto nullified, and a prima facie case of obviousness has not been presented, and the rejection cannot be sustained.

Still further, the Office Action alleges that the amount 0.03-9.3 parts by volume of the resin binder with respect to 100 parts by volume of the conductive particles is a results effective variable. However, the Office Action refers to the background section of the reference, while acknowledging that the reference does not disclose, teach or suggest the claimed limitation. Appellant traverses this allegation of "results effective variability."

While there may be a general rule regarding optimization of ranges or variables, such a presumption can be rebutted by a showing that such optimum values are not in fact obvious. See also MPEP at §214.05(II)(B). One exception to this rule includes cases in which the parameter to be optimized was not recognized to be a results effective variable. In re Antonie, 559 F.2d 618, 195 USPQ 6, 9 (C.C.P.A. 1977). That is, the prior art did not optimize, or suggest to optimize, the parameter that was optimized by the invention.

Assuming, arguendo, that the conclusion by the examiner that "it would have been obvious ... to control the amount of binder resin in the film of Yukinobu in order to obtain a transparent conductive film that exhibited the desired resistance and haze properties" is valid, the conclusion is still incomplete because the claim recites that the resin is "approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of said conductive fine particles." That is, Yukinobu et al. '792 does not disclose, teach or suggest either the amount of resin, as acknowledged by the examiner, or the relationship of the amount of resin relative to the amount of conductive fine particles. Accordingly, the allegation that the amount of resin is a results effective variable is incomplete, and cannot be sustained.

Still further, the Office Action does not suggest any motivation to determine the amount of resin actually present in any step of Yukinobu et al. '792, or to determine the amount of resin relative to the amount of conductive fine particles. Accordingly, the determination of optimum values is not in fact obvious, and the rejection cannot be sustained.

Still further, it is well known that numerical ranges recited in claims can support nonobviousness and patentability. According to the Federal Circuit, "While the measurement of a physical property may not of itself impart patentability to otherwise unpatentable claims, when the measured property serves to point up the distinction from the prior art, or advantages over the prior art, that property is relevant to patentability, and its numerical parameters can not only add precision to the claims but also may be considered, along with all of the evidence, in

determination of patentability." In re Glaug, 283 F.3d 1335, 63 USPQ2d 1151, 1155 (Fed.Cir. 2002), citing Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1216, 36 USPQ2d 1225, 1228 (Fed. Cir. 1995). As discussed above, the claimed range of resin relative to the amount of conductive fine particles is not disclosed, taught or suggested in Yokinobu et al. '792, and was acknowledged by the examiner. Accordingly, the rejection cannot be sustained.

Yukinobu et al. '792 discloses that "This film was thermally treated in a nitrogen atmosphere at 400°C for 10 minutes for forming a coating layer by *carbonizing* the acrylic resin," (column 13, lines 29-31) and "a transparent conductive film was formed by heating the transparent conductive layer *in air at 400°* for 30 minutes and then in a nitrogen atmosphere at 400° for 25 minutes." See column 13, lines 37-40. The examiner's statements of rejection does not correlate with this description.

Accordingly, the acrylic resin was *carbonized* by heating to 400° in a nitrogen atmosphere, resulting in soot remaining, i.e. carbon which can no longer function as a binder resin. Furthermore, the soot is gasified as carbon dioxide by *heating to 400° in air*, resulting in transparency. Even if some residue is still on the film after the above heating process, the residue no longer functions as a binder resin.

Several basic factual inquires must be made in order to determine obviousness or non-obviousness of the claims of a patent application under 35 U.S.C. § 103. These factual inquiries are set forth Graham v. John Deere Co., 383 U.S. 1,17,148 USPQ 459,467 (1966):

> Under § 103, the scope and content of the prior art to be determined; the differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

The specific factual inquiries set forth in Graham have not been considered or properly applied by the Examiner in formulating the rejections of the subject claims. Particularly, the scope and content of the prior art and the level of ordinary skill in the pertinent art were not properly determine and demonstrated and applied to the claimed invention.

In this application, proper consideration of factual inquiries demonstrates non-obviousness of the claimed invention. Yukinobu et al. '792 does not disclose, teach or suggest that the resin is approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of the conductive fine particles.

It is clear that one of ordinary skill in the art would not have looked at a teaching of Yukinobu et al. '792 for the resin/conductive fine particles quantitative relationship, other than as an invitation to experiment.

As discussed above and acknowledged in the Office Action, Yukinobu et al. '792 do not teach 0.03-9.3 parts by volume of the resin binder with respect to 100 parts by volume of the conductive particles. As discussed above, Yukinobu et al. '792 discloses that "This film was thermally treated in a nitrogen atmosphere at 400°C for 10 minutes for forming a coating layer by *carbonizing* the acrylic resin," (column 13, lines 29-31) and "a transparent conductive film was formed by heating the transparent conductive layer *in air at 400°* for 30 minutes and then in a nitrogen atmosphere at 400° for 25 minutes." See column 13, lines 37-40. The examiner's statements above do not correlate with this description.

Accordingly, the acrylic resin was *carbonized* by heating to 400° in a nitrogen atmosphere, resulting in soot remaining, i.e. carbon which can no longer function as a binder resin. Furthermore, the soot is gasified as carbon dioxide by *heating to 400° in air*, resulting in transparency. Even if some residue is still on the film after the above heating process, the residue no longer functions as a binder resin.

Accordingly, a prima facie case of obvious has not been established. For at least the reasons above, claim 8 is therefore patentable, and the §103(a) rejection cannot be sustained.

Claims 2-3, being dependent upon claim 8, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Accordingly, the §103(a) rejection cannot be sustained.

Still further, as acknowledged in the Office Action, a heat treatment step is used in Yukinobu et al. '792. As discussed in the previous Amendment regarding the method of Kawata et al. '962, this is a baking process. This baking process is operated at about 400°C or higher (column 5, lines 21, column 6, lines 62-64, and elsewhere) in air and then in an inert gas atmosphere.

In contrast, the present invention comprises a compressing process for obtaining conductive property. In the compressing process, the compression increases the number of contact points among the conductive fine particles to increase the contact area and the electric resistance is reduced. See page 22, line 25 to page 23, line 3. Accordingly, the electric resistance is reduced without calcining at a high temperature. See page 9, lines 7-8. The present specification clearly recites the unfavorable influence of the calcining process at page 4, lines

17-21, whereby "since a calcining step at a temperature higher than 300°C must be carried out, it is difficult to form a conductive film on a support such as a resin film. In other words, the resin film will be melted, carbonized, or burnt by the high temperature."

Not calcining at a high temperature permits the support to be "various ones such as resin film, glass, ceramics and others." See page 19, lines 7-8. Furthermore, the use of resin film results in weight reduction (page 19, line 17) and good close adhesion of the conductive fine particle layer to the film. See page 19, lines 15-16. The peel test result in the Example to evaluate the close adhesion of the conductive layer to the support film and the strength of the conductive layer reflects this remarkable effect. Additionally, the use of the resin film brings excellent flexibility of the transparent conductive film.

Accordingly, for all the reasons discussed above, it would not be obvious to make the transparent conductive film of claim 8 from Yukinobu et al. '792. Withdrawal of this rejection is respectfully requested.

Dependent claims 2-3 depend from claim 8, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

(v) **Other**

None

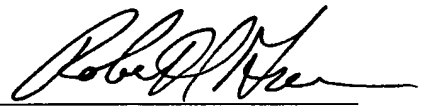
IX. CLAIMS INVOLVED IN THE APPEAL

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. OKA-0019 from which the undersigned is authorized to draw.

Dated: August 23, 2004

Respectfully submitted,

By 

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APPENDIX A

**Claims Involved in the Appeal of Application Serial No.** 09/748,188

1. (canceled)

2. (previously presented) The transparent conductive film according to claim 8, wherein said layer containing the conductive fine particles is formed by applying a dispersion liquid, which contains the conductive fine particles and the resin, onto the support and drying the liquid, said resin being contained at an amount of 0.03-9.3 parts by volume with respect to 100 parts by volume of said conductive fine particles in said dispersion liquid as represented by volume before dispersion.

3. (previously presented) The transparent conductive film according to claim 8, wherein said support is a film made of resin.

4. (Withdrawn) A method of producing a transparent conductive film, comprising the steps of:

applying a dispersion liquid on a support and drying the liquid, said dispersion liquid containing conductive fine particles and a resin, said resin being contained at an amount of 73 parts by volume or less with respect to 100 parts by volume of said conductive fine particles in said dispersion liquid as represented by volume before dispersion, thereby to form a layer containing the conductive fine particles; and then

compressing said layer containing the conductive fine particles to form a compressed layer of the conductive fine particles; and further

impregnating said formed compressed layer of the conductive fine particles with a transparent substance.

5. (Withdrawn) The method of producing a transparent conductive film according to claim 4, wherein said layer containing the conductive fine particles is compressed at a compression force of at least 44 $N/mm^2$.

6. (Withdrawn) The method of producing a transparent conductive film according to claim 4, wherein said layer containing the conductive fine particles is compressed at such temperature that said support is not deformed.

7. (Withdrawn) The method of producing a transparent conductive film according to claim 4, wherein said layer containing the conductive fine particles is compressed using a roll press machine.

8. (previously presented) A transparent conductive film comprising:

a compressed layer on a support, said compressed layer having conductive fine particles and a resin, said resin being approximately 0.03-9.3 parts by volume with respect to 100 parts by volume of said conductive fine particles, said compressed layer formed by compressing the conductive fine particles and the resin on the support with a compression force of at least $44N/mm^2$,

wherein said compressed layer further comprises an impregnated transparent substance.